

What is claimed is:

1.

A method for treatment of airway obstruction, comprising:  
providing a bone anchor, said bone anchor having suture attached thereto;  
inserting said bone anchor into a bone in the mouth of a patient; and,  
suspending the tongue of the patient using said suture to prevent the tongue from  
obstructing the patient's airway.

2.

A method for treatment of airway obstruction, comprising:  
providing a self tapping bone anchor which is sized for insertion into the  
mandible of a human patient, said bone anchor having attached suture;  
inserting said bone anchor into a bone in the mouth of a patient using an anchor  
insertion device, said anchor insertion device having a distal portion for holding  
said anchor, said anchor insertion device being of a non-linear configuration such  
that said distal portion of said device can be inserted into the mouth of the patient  
for insertion of the bone anchor into the mandible of the patient, said anchor  
insertion device further having an activating trigger located outside of the  
patient's mouth; and,  
suspending the tongue of the patient using said suture, to prevent the tongue from  
obstructing the patient's airway.

23. A method as claimed in Claim 2, further comprising the step of passing said suture through the tongue of the patient.

34. A method as claimed in Claim 3, wherein said suture is passed through the tongue of the patient using a suture passer.

5. A self tapping bone screw anchor, comprising a distal bone-piercing tip portion and a proximal portion of smaller diameter than said tip portion, said proximal portion comprising an external spiral thread, said proximal portion further comprising a rearwardly directed suture holding hole for receiving and securing a suture thereto, said bone screw anchor being provided with suture thread attached by said hole.

6. A self tapping bone screw anchor as claimed in claim 5, wherein said tip portion and said proximal portion are sized for insertion into a human mandible.

7. A bone anchor as claimed in Claim 5, wherein said head is crimped on to said suture.

8. A bone anchor as claimed in Claim 7, wherein said head is non-circular.

9. A bone anchor as claimed in Claim 7, wherein said head is crimped to form a hexagonal shape.

10. A bone anchor as claimed in Claim 5, wherein said proximal portion comprises two holes, each of said holes having suture attached thereto.

11. A combination bone anchor and bone anchor inserter comprising:

- a) a bone anchor having a bone-boring tip and a rearwardly-located proximal body portion, said body portion being provided with screw threads for facilitating insertion of said bone anchor into bone; said body portion having a rear-end portion of a non-circular shape;
- b) said bone anchor inserter having a rotatable driving socket of a shape corresponding to said non-circular shape of said rear-end portion of said body portion; the diameter of said driving socket being less than the maximum diameter of said screw threads of said bone anchor.

12. The combination of claim 11 further comprising shut-off indicating means, associated with said bone anchor inserter, to detect a change in torque of said bone anchor into bone.

13. The combination of claim 11 further comprising bone contact means associated with said bone anchor inserter and said driving socket, said bone contact means being of a greater diameter than the maximum diameter of said screw threads of said bone anchor.

14. The combination of claim 11 wherein said bone anchor further comprises suture thread secured to said bone anchor.

15. The combination of claim 14, further comprising said suture thread being crimped into a hole formed in said body portion.

16. The combination of claim 15 wherein at least one hole is formed in said body portion extending in the axial direction of said bone anchor.

17. The combination of claim 11 wherein said non-circular shape of said body portion is a polygon.

18. The combination of claim 11 further comprising suture protective means, associated with said bone anchor inserter, to protect said suture as said bone anchor is driven into bone.

19. A method of forming a bone anchor rear-end body portion, said body portion being provided with screw threads for driving said bone anchor into bone; comprising the steps of:

- a) forming a leading bone-piercing tip and a rear-end body portion having screw threads for driving said bone anchor into bone;
- b) creating a bore in said body portion,
- c) locating a length of suture in said bore;
- d) crimping said body portion to simultaneously secure said suture in said bore and form a driven, non-circular end of said body portion.

20. A method as claimed in claim 19 further comprising the steps of forming two or more bores in said body portion and locating lengths of suture in each of said bores.

21. A method as claimed in claim 19 wherin said bore is axial aligned with said bone-piercing tip.

22. A suture passer for a medical procedure comprising:

- a) a cylindrical, hollow body defining a bore passing therethrough;
- b) a reciprocatable rod portion located in said bore and axially movable therein, said rod having a leading piercing tip, said rod being further provided with a suture holding means, behind said piercing tip, which opens for receipt of suture when said

piercing tip is extended outwardly from said hollow body, and, yet, captures and secures said suture when said rod is retracted into said hollow body.

23. A suture passer as claimed in claim 22 wherein said suture holding means comprises a slot in said rod with an opening reaching the outside surface of said rod.

24. A suture passer as claimed in claim 22 wherein said rod is provided with a resilient forward end, which when extended from said hollow body, splits outwardly, to provide a longitudinal forward facing opening, and, yet, when retracted into said rod, said opening is closed.

25. A suture passer as claimed in claim 24 wherein said forward end of said rod splits into sections forming, when retracted into said rod, said piercing tip.

26. A device for reducing airway obstruction comprising:

- a) an implantable electrode capable of activating a nerve for controlling the position of the tongue;
- b) an implantable induction coil in electrical connection with said electrode, and
- c) an externally positionable driving coil, drivable with appropriate current to create a magnetic field and an induced current in said induction coil.

27. A device as claimed in claim 26 further comprising a electric current controller for creating and controlling said magnetic field in said driving coil.

28. A device as claimed in claim 27 further comprising an external sensor in electrical connection with said controller, said sensor being capable of detecting a characteristic of airway obstruction and when so detecting, providing an electrical signal to said controller to activate said driving coil.

29. A device as claimed in claim 28 wherein said sensor comprises a microphone.

30. A device as claimed in claim 28 wherein said sensor is a chest motion sensor.

31. A device as claimed in claim 28 wherein said sensor is an airflow sensor.

32. A device as claimed in claim 27 further comprising a sensor in elecrical connection with said controller, said sensor being capable of detecting the position of the tongue as a function of muscle tone of the same and providing an electrical signal to said controller to activate said driving coil.

33. A device as claimed in claim 32 wherein said sensor is a piezoelectric element.

34. A bone screw anchor inserter comprising torque sensing means for indicating the decrease in torque acting on a bone anchor as it is inserted into bone.

35. A bone screw anchor inserter as claimed in claim 34 wherein said torque sensing means is connected to a visual light which illuminates upon the decrease of said torque acting by said bone anchor inserter on a bone anchor as it is inserted into bone.

36. A bone anchor inserter as claimed in claim 34, wherein said torque sensing means provides the user of said bone anchor inserter with a tactile, audible or visual indication that said torque acting on said bone anchor by said bone anchor inserter has decreased.

37. A bone anchor inserter as claimed in claim 36 wherein said tactile or audible indication is accomplished by the combination of a spiral ramp located at the driving end of the bone anchor inserter which causes a washer with a mating head and imbedding spikes to ride thereover such that the spikes imbed into the surface of the bone upon maximum desired insertion of said bone anchor into bone, and the torque of said imbedding causes said washer to glide over and then slip back onto said ramp.

38. A suture passer for threading a suture through tissue of a patient comprising a pair of rods each having a handle end and an arc-shaped piercing tip facing one another, each tip having a suture grasping segment which when the tips are in an adjacent position to one another allow suture to be transferred from one piercing tip to the other, said rods

and said piercing tips being rotatable about one another by squeezing together or release of said handles, such that said piercing tips penetrate a tissue from both sides and suture is passed through the hole formed by said piercing tips.

39. A suture passer as claimed in claim 38 wherein said handles are spring-biased such that said piercing tips are in said adjacent position.

40. A suture passer as claimed in claim 38 wherein one of said rods is provided with a rotation bearing for the other of said rods.

41. A suture passer as claimed in claim 38 wherein suture holding and release means are provided to at least one of said piercing tips.

42. A suture passer as claimed in claim 38 wherein said piercing tips are provided with opposed and mating slots to facilitate the selective transfer of suture from one of said piercing tips to the other.

43. A suture passer as claimed in claim 42 wherein said slots are angled with respect to the longitudinal axis of said piercing tips.

44. A bone anchor inserter as claimed in claim 11 wherein said driving end of said device is provided with a retractable pin element which contacts and is forced backwardly

as said bone anchor is inserted into bone until said pin element causes an electrical shut-off of said bone anchor inserter.

45. A suture passer comprising a straight tube defining a lumen, a rod reciprocable within said lumen, said rod being formed from an elastic material such that when retracted into said tube it is substantially straight and such that when projected forwardly from said tube the portion of said rod projecting from tube bends to form a circular configuration, said rod having suture holding and release means.

46. A suture passer as claimed in claim 45 further comprising said rod formed with a second lumen and a tissue drilling needle passing through said second lumen.

47. A suture passer as claimed in claim 46 wherein said suture holding and release means cooperates with said tissue drilling needle.

48. A device as claimed in claim 26, wherein said electrode is attached to suture, said suture being attached to a bone anchor.

49. A device as claimed in claim 48, wherein said bone anchor is implanted in the mouth of a patient.

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